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DISCUSSION ON ENTERPRISE VALUATION METHOD BASED ON FREE CASH FLOW

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CONTENTS

GENERAL CHARACTERISTICS OF THE WORK

Master's thesis on the topic: DISCUSSION ON ENTERPRISE VALUATION METHOD BASED ON FREE CASH FLOW: 56 pages, 3 figures, 1 tables, 1 appendices.

Keywords: ENTERPRISE'S VALUE ； ENTERPRISE'S VALUE ASSESSMENT； DISCOUNTED CASH FLOW APPROACH ； FREE CASH FLOW APPROACH； FREE CASH FLOW；DISCOUNTED RAT

The object of the research: Free cash flow and enterprise valuation methods

The subject of the research: Brief talk on enterprise value evaluation method of free cash flow

The main goal of the research: Free cash flow and enterprise value assessment methods are introduced in order to have a deeper understanding and application. At present, the current international valuation models mainly include cash flow discount model, economic added value model and relative value model. Among them, the discounted free cash flow model plays a dominant role and is the most widely used model in the field of value evaluation with the most sound theory, which is highly praised by the majority of researchers and practitioners. Restricted by many factors such as market conditions, the discounted free cash flow model is not widely used in China's evaluation practice. In practice, the traditional evaluation method -- cost method is more used. In recent years, with the further development of capital market and property market, free cash flow discount model practice has made a certain progress, part to meet the reasonable requirements of capital market and property market, but due to the need to use this method to evaluate assumptions and subjective judgment, the some problems appeared in the process of practical application, has caused widespread controversy. This paper uses a mainstream discount model to estimate cash flow

Based on the classical theory of value method, combined with the actual situation of Chinese enterprises and capital market, this paper tries to construct a basic method of enterprise value evaluation that is suitable for our country -- enterprise value evaluation method based on free cash flow, and makes a complete case analysis of its applicability and practical significance.

INTRODUCTION

With the constant develop in the market of property right and the establishment of modern enterprise system, it becomes increasingly known that in market economy an enterprise as merchandise producer is also a kind of merchandise, which can be appraised and sold on market. The quick development of modern capital market has greatly promoted the flow of enterprise resource between different owners. In recent years, the trade of property right such as merger and acquisition, enterprise reshuffles, equity trade, venture capital investment, is visgorously developed. Enterprise appraisal is the core of the transaction. As the same time, since the eighties of the 20th century, the goal of modern corporate financial management has already changed from pursuing utmost profits and owners' wealth to utmost corporate value. Therefore, how to know corporate value and how to evaluate corporate value are not only the responsibility of appraisers, but also the consideration of investors, the authorities of business management and investment consulting organizations.

In the process of research, this paper, according to the enterprise value - enterprise value assessment theory - enterprise value assessment method - enterprise value assessment method of the advantages and disadvantages of the logical thinking, divided into several parts of the introduction, analysis of the corresponding problems, and put forward their own views. First, the author analyzes the nature of enterprises and the composition of enterprise value, and thinks that enterprise efficiency should be reflected in the maximization of enterprise value. Then, the author summarizes the origin of enterprise value evaluation thought: Irving Fisher's theory of financial budget and Modigliani and Miller's theory of value evaluation.

Among them, Modigliani and Miller systematically introduced uncertainty into the theoretical system of enterprise value assessment for the first time and scientifically proposed the definition and assessment method of enterprise value. They believed that enterprise value is equal to the sum of the discounted present value of the cash flow of its assets. On this basis, the article began to explore the enterprise value evaluation methods, after comparative analysis, the author concluded that the discount method of free cash flow is the most consistent with the current situation of China's enterprise evaluation methods, and combined with China's accounting standards on its specific parameters are discussed, the adjustment of its parameters put forward suggestions. Finally, the author introduces the application of the discounted free cash flow method in detail, and makes an empirical analysis of the applicability of the discounted free cash flow method in China's listed companies.

CHAPTER 1
INTRODUCTION TO THE STUDY OF ENTERPRISE VALUATION

1.1 Theoretical and realistic background of enterprise value assessment research

With the establishment and development of China's socialist market economy, the gradual improvement of the capital market, and the further deepening of the reform of state-owned enterprises, people pay more attention to the value of enterprises than ever before. The maximization of enterprise value or shareholder wealth is not only the goal of corporate financial management, but also the management of enterprises the fundamental starting point of reason. Therefore, what is the value of the enterprise and how to evaluate the value of the enterprise scientifically are very important to the owners, operators, creditors, market investors and other stakeholders of the enterprise as well as anyone who pays attention to the value of the company. Although along with the market economic system gradually established, the transformation into the development period, gradually clear property rights, the legal person status gradually established, but the concept of enterprise value in China have not been able to get the attention they deserve and clear understanding, facing the complex economic environment and business conditions, many people could not clearly understand the relative value of the company and its USES, Even the enterprise value and the value of the asset or stock market value, therefore also cannot in different occasions, involves the enterprise value analysis reasonably related value and correct evaluation of enterprise value, thus make the performance evaluation, mergers and acquisitions, investment and other major economic activities increases the risk of failure, may cause irreparable decision-making errors. From the perspective of theory, in the western developed countries, there has been a lot of elaboration in the financial theorists on the evaluation of enterprise value, but in China there has not been a more comprehensive and detailed discussion. Traditional financial analysis methods and performance evaluation indicators cannot fully show the value of an enterprise. The value of an enterprise should not only be analyzed and evaluated on historical data, which can only be the basis for evaluating the value of an enterprise. Enterprise value evaluation focuses more on the future earning ability of an enterprise. Therefore, it is very urgent and necessary to study the scientific enterprise value evaluation system applicable to Chinese enterprises.

1.2 Research method and framework of this paper

The research framework of this paper is as follows: The first part introduces the classical theory of value assessment, points out that the discounted cash flow model is the mainstream method of enterprise value assessment, and proposes that the discounted free cash flow method is the most suitable method of enterprise value assessment at the present stage in China; In the second part, the author briefly discusses the calculation of free cash flow and discount rate in China, and puts forward his own adjustment opinions. In the third part, combined with the characteristics of China's market, the free cash flow discount method is introduced. The fourth part of the content of the analysis and summary, and get their own views and views.

CHAPTER 2
EVOLUTION OF ENTERPRISE VALUE THEORY

2.1 Enterprise and its value

2.1.1 Nature of the enterprise

The theory of enterprise valuation emerged in England in the 18th century, as Adams Smith wrote. Believed that market competition could maximize social welfare and division of labor could improve productivity. In his economic theory, the enterprise is simplified as an assumption, that is, "maximizing profit", and the enterprise itself is a "black box", which is regarded as a production function, that is, the input-output relationship under the premise of given resources and technology level [15]. In his enterprise model, based on the hypothesis of perfect market competition and complete information, it is assumed that enterprise procurement, production and sales can be summarized as the next few processes:

(1) Determine the production of a product;

(2) Buy input Xi according to the market determined price Wi(i=1,2,...,n);

(3) Through the input-output system (black box) of the enterprise, output Q= F (X1, X 2, X3... X n);

(4) Sell Q at a market-determined price P;

(5) Corporate profit: $\pi=PQ-\sum Wi\ Xi$;

The value created by the enterprise is regarded as the profit of the enterprise, which is regarded as the difference between the selling price of the product and other production and operation costs. Here, the firm is regarded as a production function. Thus, in classical economic theory, all kinds of economic activities are carried out outside the firm, and the firm is seen as a completely rational whole that responds sensitively to its surroundings. This view is undoubtedly lack of research on the internal organization and operating conditions of enterprises.

The real modern firm theory began in the 1930s. In 1937, R. Coase published The Nature of the Firm [16]. He believes that the existence of transaction costs is the fundamental reason why the enterprise mechanism replaces the market mechanism. According to Smith, the finer the division of labor, the higher the efficiency. However, in the investigation of the actual economic situation, Coase found that many enterprises, especially large companies, did not purchase the parts and components needed for their production according to the principle of division of labor. Many of them were produced by themselves, because their own production was cheaper than outsourcing. In his view, the market fails, and the efficiency of the

market is lower than the organizational efficiency of the firm, because the transaction costs of the market are greater than the transaction costs of the firm itself.

O. E. Williamson enriched and developed Coase's firm theory [17,18,19]. He believes that enterprises and markets are two different governance structures that can handle specific types of transactions respectively[19]. For example, transactions with high asset specificity need to be produced internally in order to reduce transaction costs. With the decrease or disappearance of asset specificity, the dependence between buyer and seller is also reduced, and outsourcing is cheaper than homegrown. At this time, transactions will shift from enterprises to the market. According to his analysis, as two different regulatory bodies, the market mechanism and the enterprise mechanism have their own advantages and disadvantages, and which mechanism to adopt depends entirely on the type of transaction.

Alchian, A. and Demsetz, H. enriched the theory of the firm with the concept of term production [20]. They believe that the enterprise and the market do not have huge differences in transaction costs like Coase, the essence of the enterprise lies in the use of team production. The efficiency of team production is also the efficiency of the enterprise. In order to avoid "free rides,"(In the enterprise value assessment, it is necessary to make clear what is the enterprise and its value.) it is important to create a character who can enjoy residual claims. Entrepreneurs. The size of the enterprise depends on the measurement of the team's production capacity.

From the evolution of the above firm theory, it is not difficult to see that the premise for the existence of firms is that their efficiency is higher than the market efficiency. Market efficiency can be brought into full play through the price mechanism, which has become the consensus of economists. Then how can the efficiency of enterprises be maintained and improved? In other words, how to measure the efficiency and improvement of a business?

Business efficiency (in the eyes of managers, this is the goal of the enterprise) should be reflected in the enterprise value maximization, the enterprise value maximization is the best criterion to judge the enterprise efficiency. This is because only the concept of enterprise value can accommodate the marketization of enterprise efficiency evaluation including high risk of enterprise operation and its sustainable

2.1.2 Enterprise value

Enterprise value refers to the relationship between the attributes and functions of an enterprise that can meet the needs of the subject, the utility of the enterprise to the subject, and the best evaluation index to measure the efficiency of the enterprise .

The concept of enterprise value was clearly put forward by Professor Miller and Professor Modigliani in their paper on the irrelevance theory of corporate capital structure (MM theorem) in 1958, and the enterprise value was strictly defined and the

relationship between enterprise value, enterprise risk and enterprise capital cost was strictly defined. Now enterprise value has become a basic and foundational concept in the financial field. According to them, the value of the portfolio owned by a business depends on the operating cash flow it will generate in the future. On the basis of MM theorem, Chinese financial management researchers have discussed the definition of enterprise value from different standpoint:

(1) Wang Qingcheng [23] pointed out that enterprise value is the market value of all the assets of an enterprise,when evaluating an enterprise, what is valued is not the profit level already obtained, but the potential profitability of the enterprise.

(2) Liu Guisheng [24] questioned Wang Qingcheng's view and believed that enterprise value is the sum of the present value of the replacement cost, organizational cost and the adjusted future profit level.

(3) Yuan Yijun and Chen Yanying [25] believed that the enterprise itself, as a special commodity, its value reflects the market's recognition of the products or services provided by the enterprise, as well as the expectation of the enterprise's long-term development and value-added potential.

We can see that due to the inherent richness and complexity of enterprise value, people can observe the formation process of enterprise value and its maximization through different methods. It is of great significance to satisfy the rights and interests of all kinds of income claimants to the greatest extent. The enterprise value equation reflects the different angles from which the enterprise value is observed, and there are three common ones: market pricing, investment pricing and cash flow pricing.

2.2 Review of enterprise valuation methods

2.2.1 Origin of the thought of value evaluation

1. Irving Fisher's theory of financial budgeting

The thought of enterprise evaluation originates from Irving Fisher's theory of financial budget. He analyzed the formation process of capital value, explained the source of capital value, and laid the foundation for the modern enterprise value growth theory. In 1906, Irving Fisher published his monograph “The Nature of Capital and Income” [1], which fully discussed the relationship between income and capital and the source of value. Starting from his feeling of income, Fisher analyzed the formation process of capital value, explained the source of capital value and summarized the process of people's investment decision-making, thus laying a foundation for modern Financial Budget theory and becoming the cornerstone of

modern enterprise value growth theory. In his book, he points out that the capital value is determined by the following steps (Figure 2.1) :

The first step is to determine the future flow of services to be provided from capital goods.

Second, determine the revenue value of these services;

The third step is to derive the value of capital from the value of these incomes.

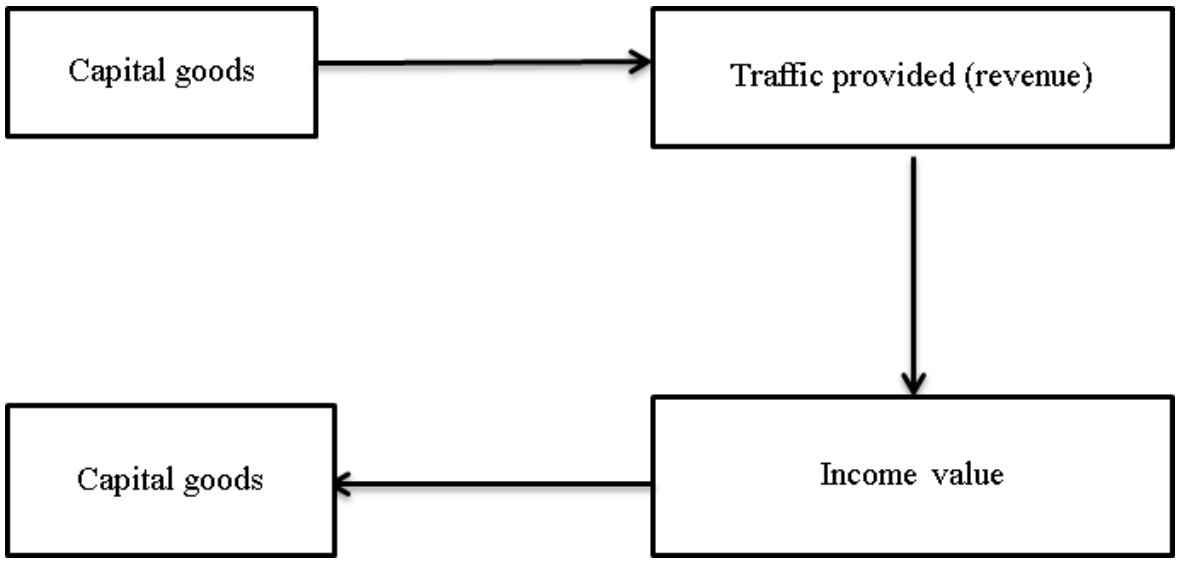

Figure 2.1 Irving Fisher's capital valuation model

Note-source: The author arranges by himself

In addition, Fisher summarized the theory of capital value:

First, capital value is the capitalized or discounted value of income.

Second, if interest rates fall, the value of capital (the capitalisation of expected income) will rise; and vice versa.

Third, capital values fluctuate relatively more for durable goods such as land and less for temporary goods such as clothes.

Fourth, by increasing the value of capital through savings, the value of capital increases as savings increase, while real income decreases by the same amount as savings increase.

Fifth, the savings that come out of income and put into capital are the basis for future real income.

Moreover, in 1907, Fisher published another monograph of his, Interest Rate: Essential Decision and Its Relationship with Economic Phenomena [2], which further studied the relationship between capital income and capital value from the analysis of the nature and determinants of interest rate. Thus, a complete and systematic framework of capital value evaluation is formed. The capital value evaluation technology under certain conditions is the foundation of modern standard or orthodox evaluation technology.

Fisher pointed out that in the certainty case, the value of an investment project is the present value of the expected future cash flows discounted by a certain risk rate. The present value of the future income that the investor expects to obtain is the value of the investment now. Only when the present value (value) of the future benefit of the project is greater than its investment (cost), the investor will make investment. If the establishment of a business is also regarded as an investment, the value of the business is the present value of the future income flow that the business can bring.

In the eyes of modern people, Fisher's value evaluation model is indeed very simple, but the essence of the thought stated in the model is the foundation of the development of modern value evaluation technology, and also the guiding light of the interpretation of the value evaluation theory.

2. Modigliani and Miller's theory of value evaluation

However, in reality, enterprises are faced with an uncertain market and their future earnings are also uncertain. In such an uncertain environment, Fisher's theory loses its foundation.

In 1958, two scholars F.Modigliani and M.H.Miller (MM) published their epoch-making work “The Cost of Capital, Corporate Financing and Investment Theory [4] ,” which systematically introduced uncertainty into the theoretical system of enterprise value evaluation for the first time. This paper scientifically puts forward the definition of enterprise value and the evaluation method of enterprise value, and for the first time discusses on the relationship between enterprise value and enterprise capital structure.

MM theory proves that under some highly restrictive assumptions, because the tax law allows interest expense to deduct taxable income before tax and reduce corporate income tax, the value of a company will continue to rise as its liabilities continue to increase. The value of a company is greatest when it is financed almost entirely with debt. If there is no enterprise income tax, the enterprise cannot obtain benefits through financial leverage, and the change of capital structure will not have any impact on the enterprise value. Although MM's hypothesis cannot be established in reality and the conclusions derived are not completely in line with the actual economic life, the theory still provides a basic framework for enterprises' financing decisions. But it can only describe, not accurately describe, the relationship between financial leverage, earnings per share, cost of capital and share prices.

MM Quantitative I and Theorem II explore the enterprise value evaluation method under the condition of uncertainty, and answer the relationship between enterprise value and enterprise capital structure. In the case of uncertainty, enterprise value is defined as: under the condition of capital market efficiency, it refers to the market value of the enterprise, which is equal to the sum of the equity market value and debt market value of the enterprise. The value of a stock, before taxes are taken into account, is the present value of the shareholder's remaining earnings over the next N years. The value of a claim is equal to the present value of its expected interest plus the present value of its final par value. If the debt and shareholder investment of the enterprise are regarded as capital, the value of the enterprise is equal to the present value of the flow of future expected earnings discounted by the capitalization rate. The larger the expected revenue flow of an enterprise is, the greater the return to the capital provider will be, and the more valuable the enterprise will be. In the case of uncertainty, the enterprise value evaluation model without considering tax is as follows:

$$Vj = Sij + Dji = Xi / \rho k$$

$$\rho k = ij \times Sj/Vj + r \times Dj/Vj$$

Where: Vj -- the value of the enterprise (the market value of the enterprise);

Sj -- the value of shareholders' equity (the market value of equity);

DJ -- the value of corporate debt (the market value of debt);

Xij -- the expected return of a business (expected earnings before interest);

ρ k -- cost of capital (weighted capitalization ratio of debt and equity);

Ij -- return on common equity;

R - Fixed rate of return on corporate debt.

On this basis, Modigliani and Miller published Dividend Policy, Growth and Stock Valuation in 1961[5], and analyzed the impact of dividend policy on enterprise value. They derive the enterprise value evaluation model under the condition of complete capital market, people's behavior is completely rational and completely deterministic.

Modigliani and Miller then published Dividend Policy, Growth and Stock Valuation in 1961 [5], analyzing the impact of dividend policy on enterprise value. They derive the enterprise value evaluation model under the condition of complete capital market, people's behavior is completely rational and completely deterministic.

2.2.2 Oncrete application form of enterprise value appraisal method

The general method of cash flow discounting implies that the value of any asset is the present value of its future earnings discounted at a certain discount rate. Because net cash flow can reflect all value factors more comprehensively and

accurately than earnings per share and profit indicators on an accrual basis. The basic calculation formula is as follows:

$$V = \sum_{i=0}^{\infty} \frac{CF_i}{(1+r)^i}$$

CFI: is the cash flow of Phase I;

R: Is the discount rate reflecting the risk of cash flow;

N: It is the life of the enterprise.

CFi is the predicted value of cash flow in each future year. Based on the company's historical years of sales revenue, sales profit rate, sales revenue growth rate, income tax rate, additional marginal funds for fixed assets and current assets, it predicts the company's cash flow in the future. This method uses the matching relationship between income and cash flow to make predictions on the premise that the business activities of the enterprise maintain stable growth.

According to the research of Copeland, Kaplanandothers[28], in all cash flow-based enterprise value evaluation models, according to different definitions of cash flow and discount rate, there are two basic ideas for enterprise value evaluation:

One is to take shareholders as the claimant of the ultimate rights and interests of the enterprise, the corporate value is the shareholder value, which directly evaluates the value of the stock. It is called equity method of enterprise value evaluation; the other is to take the corporate fund supplier as a whole as the claimant of the corporate rights and interests, and the corporate value is the value of the entire enterprise, including shareholder equity, debt value and preferred stock value. It is called the free cash flow method of enterprise value.

2.2.3 Comparison of Enterprise Value Evaluation Methods

In the application of the discounted cash flow method, in terms of cash flow, there are usually two forms to choose: dividends applicable to equity valuation models, and company free cash flow applicable to company valuation models. Dividends are generally regarded as a way for listed companies to return cash to shareholders. The discounted dividend model is the most conservative estimate of the value of a company's equity. Free cash flow is the remaining cash flow generated by the enterprise after the reinvestment needs are met. This part of the cash flow is the maximum amount of cash that can be allocated to corporate capital suppliers without affecting the company's sustainable development. So in terms of cash flow, the free cash flow method is better than the dividend cash flow method

When using these two methods to evaluate listed companies, we can find that the discounted free cash flow method is more accurate and more complicated than the dividend method due to the following factors:

Free cash flow is not affected by accounting method, are less likely to be manipulated, can largely avoid net profit and cash flows of activity index in measuring of the insufficiency of the performance of listed companies, and combining various information, integrated continued operation of shareholders and corporate factors, effective characterization of listed companies based on long-term development potential of value creation ability.

Free cash flow takes into account the continuous movement process of capital. After any capital user puts capital into production and operation to purchase means of production and labor, new products will be produced, new values will be created, profits will be brought, and appreciation will be realized. Free cash flow reflects the time value of capital by discounting, giving the user of the indicator a more credible value.

CHAPTER 3
FACTOR ANALYSIS OF FREE CASH FLOW DISCOUNT METHOD

After conducting marketing research and market analysis we need to set goals, develop marketing strategy and marketing mix, develop plan of actions for launching and promoting in the market.

3.1 Definition of free cash flow

Free cash flow is the remaining cash flow generated by the enterprise after the reinvestment needs are met. This part of the cash flow is the maximum amount of cash that can be allocated to corporate capital suppliers without affecting the company's sustainable development [31].

American scholars Franco Modigliani and Mertor Miller pioneered the concept of free cash flow [32]. In 1961, they expounded for the first time the idea that the value of a company, like the value of other assets, also depends on the cash flow it generates in the future. The Miller-Modiglini company entity value evaluation formula was the first attempt to measure the overall value of the.

Ft=It-1 ×(1+g) ×Pt×(1-T)-(It-It-1) ×(ft+wt)

Ft -- cash flow of year t

It -- Sales revenue for the t year

g -- Growth rate of operating revenue

Pt -- profit margin on sales

T -- Income tax rate

ft -- the additional investment in fixed assets required for every 1 yuan increase in operating income in the year t

Wt - Additional investment in current assets for each $1 increase in operating income in year t

Professor Tom Copeland(1990)[28] elaborated on the calculation method of free cash flow in more detail: “Free cash flow is equal to the net operating profit of a company (Net Operating Profit less adjusted Tax), which is about the amount of operating profit excluding interest income and expenditure after deducting actual income tax) plus non-cash expenses such as depreciation and amortization, minus additional working capital and property, plant, equipment and other assets investment. It is the total after-tax cash flow generated by the company, which can be provided to

all suppliers of company capital, including creditors and shareholders. “His method is more detailed, taking into account depreciation and amortization.

Ft= (N+D)-(Cl+Ic)
Ft -- cash flow of year t
N-- Net operating profit after tax
D-- Depreciation and amortization
Cl-- Capital spending
Ic-- Increase in working capital

Professor Aswath Damodaran (1996) defines free cash flow as Referencing Copland's point of view:

Ft=EBIT×(1 -T)+D-Cl-Ic
Ft -- cash flow of year t
EBIT-- Interest before tax
D-- Depreciation and amortization
Cl-- Capital spending
Ic-- Increase in working capital

Professor Aswath Damodaran also proposed the concept of free cash flow to equity -free cash of equity capital flow [29].The amount is the cash flow after deducting operating expenses, repayment of principal and interest, capital expenditures required to maintain a predetermined cash flow growth rate, and increased working capital expenditures. The free cash flow is the sum of the cash flows of all claimants of the company, including ordinary shareholders, preferred shareholders and creditors. Free cash flow equals equity free cash flow plus debt free cash flow.

K. S.Hackel(1996) proposed that free cash flow is equal to net cash flow from operating activities minus capital expenditures, plus the discretionary expenditure part of capital expenditures and other expenditures.reference Because these arbitrary expenses (such as investment mistakes, excessive investment and so on) can be saved without affecting the company's future growth. He believes that as long as it is not to maintain the company’s continuing operations, the cash expenditure should be added back to the free cash flow; the company can avoid these expenditures without affecting the continuing operation, and if the company does not make these expenditures, the company’s free cash flow will be to increase. This definition takes more into account the possibility of "abuse of free cash flow" by the company's management authorities [32].

Standard & Poor's(Standard& Poor's) assessment agency defines free cash flow as profit before tax minus capital expenditure. Another simpler method is that free

cash flow is the difference between net cash flow from operating activities and capital expenditures. In addition, American listed companies often announce free cash flow in the annual report, but there are differences in its calculation methods. For example, in the 2009 General Dynamics Corp. Annual Report, free cash flow is referred to as cash flow from operating activities and investing activities, except for tradable securities investments. Other cash flows from investment activities excluding capital expenditures and securities investments are smaller. Thus, this definition is very close to net cash flow from operations minus capital expenditure. Another example is RJRNabisco Investment Holding Company,as defined in its annual report: free cash flow equals net cash flow from operations less capital expenditures and preferred stock dividends paid [12,33].

From such statements, we can extract some consensus on the concept of free cash flow:

1. The basic definition of free cash flow as net cash flow from operations minus capital expenditure is consistent with its implied connotation.
2. Free cash flow fully takes into account the cash flow requirements of the company's continuous operations and necessary investment growth .
3. Free cash flow, as a kind of cash surplus, is the financial basis for the company to repay creditors and distribute cash dividends to shareholders.

3.1.1 Use the indirect method to calculate the company's free cash flow

1. Calculation of net operating profit after tax

Net operating profit after tax(NOPAT)is one of the important concepts in free cash flow measurement. It means it is the net operating profit based on the realizationsystemof receipt and payment, but we can only calculate from the operating profit (earnings before interest and tax) after deduction of income tax based on the accrual system.

NOPAT=EBIT × (1 -It)+ Dt

NOPAT-- Net operating profit after tax

EBIT-- profit before interest and tax

It-- income tax rate

Dt-- increase in deferred tax

Earnings before interest and taxes are not listed in China. Income statement, but they can be obtained by adjusting the accounting items listed in the operating profit calculation formula:

EBIT= Pt+ Op+Fe

EBIT-- profit before interest and tax

Pt-- main business profit

Op--other business profit
Fe-- financial expenses make

2. Calculation of non-cash expenses

In accounting, due to the principle of prudence in accounting, certain possible asset losses should be provided for corresponding impairment. When these reserves are made, profits will be affected, but cash flow will not be affected. Because the withdrawal of various reserves is just to transfer the relevant funds from some accounts of the balance sheet to some accounts of the income statement. In consideration of the principle of prudence, China requires listed companies to make provisions. According to the accounting system, the annual report of listed companies shall provide eight impairment reserves - namely: bad debt reserves, short-term investment depreciation reserves, inventory depreciation reserves, long-term investment depreciation reserves, fixed assets depreciation reserves, intangible assets depreciation reserves, Provision for impairment of construction in progress and provision for impairment of entrusted loans.

Among these impairment reserves, only the provision for bad debts and inventory depreciation reserves will affect the pre-interest and tax profit, which in turn will affect the calculation of free cash flow. The provision of other reserves belongs to non-recurring losses arising from non-operating items and is not included in the calculation of free cash flow. See Table2.1.

Table 2.1–Accounting items that are accrued and prepared to be included

Asset impairment provision	Accounting items to be included in the provision
Bad debt provision	Management costs
Inventory impairment	Management expenses (loss of inventory falling in price)
Short-term investment depreciation	Investment income
Long-term investment impairment	Investment income
Provision for impairment of fixed assets	Operating expenses
Provision for impairment of intangible	Operating expenses
Provision for impairment of construction	Operating expenses
Entrusted loan impairment provision	Investment income

Note-It comes from self-organization

When there is no write-off of the inventory depreciation provision because the sales price is lower than the cost, the inventory depreciation provision is the difference between the ending balance and the beginning balance of the inventory depreciation provision account. In the case of the foregoing, the offset portion shall be added. In fact, the inventory depreciation reserve data can be obtained from the

"Schedule of Asset Impairment Reserve" attached to the balance sheet. Others, such as provisions for bad debts, are similar to inventories. The amortization of prepaid expenses and the withdrawal of accrued expenses are discussed in the article of the increase in working capital.

Non-cash expenditure has the following equation:

Nc=Py + Pd+Ae +We +D +Al -Te

Nc-- Non-cash expenses

Py-- provision for bad debts accrued in the current year

Pd-- provision for inventory depreciation accrued in the current year

Ae-- amortization of deferred expenses

We-- with drawn accrued expenses

D--depreciation

Al-- amortization of intangible assets and long

Te-- term deferred expenses

3. Calculation of increase in working capital

When calculating the increase in working capital, working capital is not simply equal to the difference between current assets and current liabilities, it is equal to the difference between a part of current assets and interest-free current liabilities. Part of the current assets include monetary funds, notes receivable, accounts receivable, other receivables, prepaid accounts, inventory and prepaid expenses held for daily needs. Interest-free current liabilities include bills payable, accounts payable, accounts payable in advance, wages payable, welfare fees payable, taxes payable, other payables and accrued expenses.

It is worth noting that when calculating the increase in working capital, the accounts receivable, other receivables, and inventory data are not the net amount after deducting the provision for impairment. Because the provision for impairment does not lead to changes in cash flow. The data on accounts receivable, other receivables, and inventories listed in the balance sheet of listed companies are net accounts receivable, net other receivables, and net inventories. The required data can be obtained in the notes to the accounting statements related to accounts receivable, other receivables, and inventories. The required data can be obtained in the notes to the accounting statements related to accounts receivable, other receivables, and inventories.

Increase/decrease in working capital = increase (minus: decrease) in monetary funds, notes receivable, accounts receivable, other receivables, prepaid accounts, inventory and prepaid expenses-notes payable, accounts payable, accounts received in advance, payable iIncrease in salary, welfare fees payable, taxes payable, other payables and accrued expenses.

As mentioned in the previous article, the increase in working capital caused by the increase in cash or securities outside the scope of the company's daily operations (called abnormally held cash or securities) is not included in the additional working capital. The deposit of monetary funds by enterprises here refers to satisfying transactional and preventive needs. A basic fact is that only the company's internal management knows how much money a company holds for daily needs. They often do daily income and expenditure management, speed up cash flow and other tasks, determine the best cash holdings, so as to meet the needs of production and operation turnover with the lowest cash holdings. Therefore, there are two alternative methods in practical operation.

One is that all cash and securities that exceed 0.5%—2.0% of sales revenue are considered abnormally held cash or securities, and then the amount of "monetary funds" and "short-term investments" listed in the balance sheet. It is deducted to get the monetary funds that the company holds for daily needs.

The second is that the holdings of cash or cash equivalents in a certain year are normal, and the monetary funds deposited by enterprises in other years are based on the ratio of the holdings of cash or cash equivalents to sales revenue in the year multiplied by the sales revenues of other years to estimate. This approach is based on the assumption that the amount of cash or securities held depends on the volume of business in terms of sales revenue [32].

In fact, an increase (decrease) in inventory does not necessarily mean an increase (decrease) in cash flow. In the presence of credit sales or credit purchases, changes in inventory may cause changes in receivables and payables, not just increases or decreases in cash flow. However, from the overall perspective of working capital, including items such as inventories and accounts receivable and payable, it can reflect changes in cash flow. There is also a situation that when dealing with damaged, obsolete, or selling prices lower than the cost of inventories, the provision for falling prices of inventories must be offset, which will also lead to a decrease in inventories.

The reduction in this situation is unlikely to cause an increase in cash flow, but it is a shrinkage of inventory. This part should therefore be added back to the increase in working capital, that is, the increase in inventory is equal to the ending and beginning balance of inventory plus this part of the reversed inventory. The write-off of inventory depreciation reserves can be obtained in the “Detailed Statement of Assets Depreciation Reserves” attached to the financial statements. In fact, if the amount that has been written off is not included in the calculation of the inventory depreciation reserve when calculating the non-cash expenditure in the previous article, it is not included in the increase in working capital at this time, and one decrease and one increase will just offset. It can be seen that the provision for bad debts for accounts receivable is similar to the situation.

Interest-free current liabilities are relative to interest-bearing current liabilities such as short-term loans and long-term liabilities due within one year. Its increase or decrease reflects the occupation of working capital. For example, when the balance of bills payable or accounts payable at the end of the reporting period is less than the balance of bills payable or accounts payable at the beginning of the period, it indicates that the cash paid to the supplier in the current period is greater than the cost of sales confirmed in the income statement. Conversely, if the balance of bills payable or accounts payable at the end of the reporting period is greater than the balance of bills payable or accounts payable at the beginning of the period, it means that some of the inventory purchased in the current period has not paid cash, but it is confirmed in the cost of sales in the income statement. .

The difference between the ending and beginning balance of deferred expenses is not equal to the increase (or decrease) of deferred expenses, but is equal to the difference between the increase (or decrease) of deferred expenses minus the amortization amount of deferred expenses. The increase (or decrease) of the deferred expenses should actually be the sum of the difference between the ending and beginning balance of the deferred expenses plus the amortization amount of the deferred expenses. Therefore, in the calculation of non-cash expenses above, the amortization amount of deferred expenses may not be considered. Here, the increase (or decrease) of deferred expenses can be regarded as the difference between the balance of deferred expenses at the end of the period and the beginning of the period. One decrease and one increase just offset.

Accrued expenses are similar. When calculating non-cash expenditures, the withdrawn expenses may not be considered, and the difference between the ending and beginning balance of the accrued expenses related to operating activities is directly reflected in the increase in working capital.

From this point of view, the concept of net increase in working capital can be derived from the increase in working capital. The net increase in working capital is equal to the sum of the increase in working capital minus the provision for bad debts, the provision for inventory decline, the amortization of prepaid expenses, and the accrued expenses withdrawn.

Nc=TBNPNB-NAPAWTO=If+Ip-Di-Pw-Ov-Re+Ie

Nc-- Net increase in working capital

TBNPNB-- the difference between the closing and opening balances of monetary funds, bills receivable, net accounts receivable, net other receivables, prepaid accounts, net inventories, and prepaid expenses

NAPAWTO--notes payable, accounts payable The difference between the ending and beginning balances of payments, accounts received in advance, wages payable, welfare fees payable, taxes payable, other payables and accrued expenses

If--Increase in monetary funds-decrease in operating receivables (plus: increase)

Ip--increase in operating payables (decrease: decrease)

Di--decrease in inventory (plus: increase)

Pw--provision for bad debts or write-offs Bad debts-provision for inventory fall in value

Re--reduction of prepaid expenses (plus: increase)

Ie-- increase of accrued expenses (minus: decrease)

Free cash flow = (net operating profit after tax+ non-cash expenditure)-(capital expenditure+ increase in working capital)

=Net operating profit after tax-net increase in working capital-net capital expenditure

In fact, if there is no internal information in practice, it is difficult to calculate the increase in working capital and non-cash expenditures based on the disclosed information. The net increase in working capital does not require undisclosed information, and it is feasible to calculate free cash flow through the net increase in working capital.

4. Calculation of capital expenditure

When there are no fixed assets disposal, investment in fixed assets, scrap or damage of construction projects in progress, the new expenditure on fixed assets is equal to the difference between the fixed assets, the ending balance of the construction in progress and the beginning balance. It should be noted that: the data of fixed assets is taken from the original price of fixed assets in the balance sheet, not the net fixed assets after deduction of accumulated depreciation, or the net fixed assets after deduction of accumulated depreciation and fixed asset impairment provision.

The construction in progress is not the net amount after deducting the provision for impairment of construction in progress. Because the provision of depreciation and impairment does not lead to changes in cash flow. In the event of the disposal of fixed assets, investment in fixed assets, scrap or damage of construction in progress, the amount of fixed assets and construction in progress will be reduced as a result, and the new expenditure on fixed assets will be greater than the real oneat of fixed assets and construction in progress.

Therefore, when calculating the new expenditure of fixed assets, these reductions in the current period should also be added. In fact, the new expenditures of fixed assets can be obtained by adjusting the relevant data listed in the notes to the accounting statements, the current increase in fixed assets and construction in progress minus the amount of fixed assets transferred from construction in progress.

Unlike fixed asset amortization, the depreciation expense is reflected in accumulated depreciation and does not directly offset its book amount. For intangible assets and long-term deferred expenses, when amortization occurs, it directly offsets the book amount. Therefore, in the case of intangible assets, long-term the new

expenditure on deferred expenses is not simply equal to the difference between the end and the beginning of the period. When occurrences such as amortization of intangible assets, provision for impairment of intangible assets, and amortization of long-term deferred expenses, etc., they all affect the changes in the ending and opening balances.

Capital expenditure=current increase in fixed assets + current increase in construction in progress-fixed assets transferred from construction in progress + current increase in intangible assets + current increase in long-term deferred expenses

3.2 Estimated discount rate analysis

In the discounted cash flow model, the cash flow of each period must be discounted into the present value at the discount rate that reflects the degree of corporate risk. Since there are different cash flows (Such as capital investment) in value evaluation, there are two different discount rates corresponding to it, namely, the cost of equity capital and the weighted average cost of capital on this basis. The basic steps for estimating the discount rate in this way include calculating the cost of equity capital, calculating the cost of debt capital, determining the company's target capital structure, and calculating WACC.

3.2.1 Capital Asset Pricing Model (Capital Asset Pricing Model, CAPM)

The capital asset pricing model is essentially a generalization of Fisher's fully deterministic model (Watz, LiuMoerman,1999) [35], and Sharp(1964)published a titled "Capital Asset Price—In Risk Conditional market equilibrium" theory paper [36],the conclusive theory of the paperis called the capital asset pricing model.

The central conclusion of CAPM is that the market portfolio is on the efficient frontier, and all other points are the combination of market portfolio plus borrowing or lending; another key conclusion is the relationship between the expected return of a security and its sensitivity to the market.

Although CAPM is based on a rigorous risk-return theory, facts have proved that it has considerable practical value. So far, the capital asset pricing model is the most mature risk measurement model and a standard for measuring other risk-return models. The model uses variance to measure non-diversified risks and associates risk with expected returns. The risk of any asset that cannot be diversified is described by β value, and the expected rate of return is calculated accordingly. The basic formula is as follows:

$E(R)=Rf+\beta\,(E[Rm]-Rf)$

In the formula: Rf——the market rate of return of risk-free assets;

E(Rm)——the expectation of expected market returns; E(R)——the expectation of expected enterprise returns; β ——Risk free factor

In the case of a certain risk, the rate of return required by investors is the cost of equity capital of the enterprise, and the difference between the expected rate of return on the market and the risk-free interest rate is the risk premium. So the above formula can be written as:

$R=Rf+\beta(Rm-Rf)$

For this, it is necessary to determine the risk-free interest rate, estimate the risk premium, and calculate the β value.

1. Determine the risk-free rate

Generally, the risk-free interest rate is defined as an asset for which investors can determine the expected rate of return. Therefore, a risk-free investment must meet two conditions: First, there is no risk of default. Generally speaking, this means that the securities must be issued by the government; second, there is no uncertainty about the rate of return on investment. This means that the risk-free interest rate is the interest rate of the national debt with the same duration as the analyzed cash flow. In theory, this can be directly translated into the use of different risk-free interest rates for each cash flow of the enterprise value assessment-for example, using a one-year U.S.treasury bond interest rate in the first year, and a two-year treasury bond interest rate in the second year.

In foreign countries, people believe that U.S. treasury bonds should be used as the risk-free rate of return [37]. However, there are still disputes over the maturity of the selected treasury bonds. There are mainly the following three points of view:

①The short-term treasury bond interest rate is used as the risk-free interest rate, and the reason is capital asset pricing(The short-term treasury bond are less risky). The model is a single-period model(R.Merton,1973) [37];

②Use the current year’s short-term government bonds and the market’s historical risk premium rate of return to calculate the cost of equity capital for the first period (year), and use each term in the term structure. The annual forward interest rate estimates the risk-free interest rate for each year in the forward period, and estimates the cost of equity capital in the future[38];

③The current long-term treasury bond interest rate is used as the risk-free interest rate, because the purpose of determining the necessary fair rate of return is to judge the choice of long-term capital investment .

In theory, the three views are acceptable. It can be considered that CAPM is a current risk-return model, using the current short-term treasury bond interest rate as a reasonable expectation of future short-term interest rates, or it can focus on the existence of forward interest rates in predicting future interest rates. Advantages, or

the belief that long-term treasury bonds have the same maturity period as the valued asset.

In view of the relatively high risks in my country's capital market, and the assessment of corporate value generally believes that the life span of a company is infinite, the author believes that it is more appropriate to use long-term government bond interest rates as the risk-free interest rate in my country. But in other countries, it may not apply. When it comes to it, you have to make sure it's right.

2. Estimated risk premium

In the CAPM model, the (Rm-Rf) part is the so-called risk premium, which generally refers to the difference between the average return rate of specific stock in a market portfolio and the average return rate of risk-free assets in an extended historical period. Therefore, this data is usually calculated on the basis of historical data. In the specific calculation process, usually the following issues need to be considered:

First, how long should the observation period of the sample be ;

second, what is the market rate of return;

third, whether to use the arithmetic average or geometric average when calculating the average.

In foreign countries, the observation period used by analysts is generally10years or more. Using as much data as possible can partially eliminate the fluctuations in risk premiums over time. Most analysts in the United States use securities market statistics since1926. The data is used to calculate the average risk premium interest rate of the US stock market, and the history of my country's stock market is limited, but there are more than ten years of data available.

When calculating the risk premium, how to choose the "market rate of return" is an unresolved problem in academia so far. According to the standard CAPM model, the market rate of return should be the rate of return of the "market portfolio" [38] ,which is composed of all assets in the market with their respective values as weights. However, in actual research, such a "market combination" is often difficult to achieve. Therefore, more large sample data (such as the US S&P500 index)

The development time of country’sChinese capital market is relatively short. The stocks of listed companies have their own characteristics in the equity structure. Most of the stocks of listed companies are composed of state shares, legal person shares, employee shares, and public shares. Due to historical reasons, my country’s listing and circulation of the shares is limited to public shares (including some employee shares and transfer shares), and other shares are temporarily unavailable. SSE 30 and SZSE constituent stocks based on tradable shares cannot meet the requirements of a large sample because they contain 30 stocks and 40 stocks, respectively, and are not universally representative[9]; the newly released SSE 180

and Shenzhen 100 contain more stocks, but they are unusable due to lack of historical data. At the beginning of the establishment of the stock market, the Shanghai Composite Index and Shenzhen Composite Index released covered all the stocks traded in the two markets, which were the two composite stock indexes containing the most stocks in China at present, with a wide range of stocks

Representativeness of. Therefore, the author believes that under the current conditions of China's capital market, we should choose the average of Shanghai and Shenzhen composite indexes as the market rate of return. However, the defect of these two indexes as the subject matter is that the comprehensive index, which is based on circulation price and calculated by circulation quantity, cannot accurately reflect the whole market wave.

There is a big controversy in the academic circles as to whether to use the arithmetic mean or the geometric mean to calculate the market-interest rate. Those who advocate the use of arithmetic mean believe that the arithmetic mean is more in line with the CAPM expectation-variance theoretical framework, and can make better predictions about the return rate of the next period; those who advocate the use of geometric mean think that the geometric mean is considered The compound interest calculation method is a better estimate of the long-term average rate of return. the premium rates obtained by these two methods may be quite different[9].

The rate of return calculated by using the geometric mean is generally lower than the arithmetic mean. Because the enterprise value assessment is to discount the cash flow over a long period of time, the author’s point of view is that the geometric mean will estimate of the risk premium better.

3. Estimate the β parameter of the CAPM model

The β parameter is called the risk parameter of the enterprise in the formula, which describes all the non-diversified risks of the enterprise. It is the only parameter in the formula related to the enterprise itself. No matter how the risk-free interest rate and the risk premium are determined, every enterprise has its own risk parameter β value. The general method of estimating the value of β is to perform regression analysis on the company’s stock return (Rj) and the entire market return (Rm) :

$$Rj=a+\beta\ Rm$$

a -- the intercept of the regression curve;

β -- the slope of the regression curve;

Several issues that need to be paid attention to when performing regression analysis are:

In the capital asset pricing model, finding the β parameter is the most important step, and four issues need to be considered when performing regression analysis. The first is the question of the return period. In the United States, there are many specialized analysis institutions such as Value Line, Standard and Poor's, and

Bloomberg, etc., they use different lengths of return periods. Most of them use five-year historical data.

Bloomberg uses ten years of historical data to estimate the β value [9].The trade-off is simple: the longer the estimation period, the more data can be used, and the better it can meet the statistically large sample requirements.

The second problem is the time interval of the data used in the regression analysis. You can use a period of time in a year, month, week, day, or even a day as the unit of return. Regression analysis can increase the number of observations by using a time unit of days or less as the unit of return. The number of observations can be increased in days or Regression analysis with a smaller unit is of course better, but considering the issue of the observation period, starting from the principle of cost-effectiveness, using a weekly or monthly rate of return can significantly reduce the sample size, so the author believes that choosing weekly or monthly as the rate of return for the time unit is preferable.

The third problem is the choice of market return in regression analysis. The correct index used in the analysis should be determined by the marginal investors of the stock a good index should be an index that takes into account the largest investor of the company's stock and the market with the largest trading volume, so the average β value is estimated.

The cost of debt refers to the cost paid by an enterprise for borrowing money (including loans from financial institutions and issuing corporate bonds). In the case of no income tax, it is interest paid to creditors; In the case of corporate income taxes, it equals the interest times (1- the tax rate). When calculating the weighted average cost of capital, in addition to the cost of equity financing, there is also the determination of the rate of return on debt.

A reasonable estimate of the bond yield in China is to combine the corporate bond yields publicized in the market with the long-term (5 years and more) bank loan interest rates. At present, in China, only a very small number of large state-owned enterprises or national key engineering projects can be approved to issue corporate bonds. . In fact, a real corporate bond market has not yet established in China, although some corporate bonds can be listed and traded. On the other hand, the official loan interest rates are relatively easy to obtain. Therefore, we can use the effective long-term loan interest rate on the evaluation base date as the long-term debt yield.

For short-term claims, for the same considerations, we use bank loan interest rates valid within one year on the base date is used as the short-term debt yield.

CHAPTER 4
COMPANY VALUE EVALUATION BASED ON FREE CASH FLOW DISCOUNT METHOD

4.1 Steps of discounted free cash flow method

The use of discounted free cash flow method to assess the value of a company is generally divided into five steps, which are:

1. historical performance analysis,
2. future performance prediction,
3. capital cost estimation,
4. continuous value estimation,
5. calculation and interpretation of the valuation results.

To put it simply:

First, predict the next 10 years' annual free cash flows, discount the 10 years' annual free cash flows to the present value, and then add these discounted present values to produce a "10 years' discounted sum."

Then take the free cash flow of the last year to calculate the sustainable value and discount it to the present value to get the "present value of sustainable value".

Finally, "the sum of the next 10 years discounted + the present value of the sustainable value" is "the intrinsic value of the enterprise".

4.1.1 Historical business performance analysis

Since company value is based on discounted free cash flow, the potential value drivers of the company must also be able to drive free cash flow. There are two key factors that can drive free cash flow and value: the growth rate of the company's sales revenue, profit and capital base, and the rate of return on invested capital [30].

Companies that earn more per dollar of invested capital are worth more than similar companies that earn less. Similarly, companies with higher growth rates are worth more than companies with lower growth rates if they earn the same rate of return on invested capital and this rate of return is sufficient to satisfy investors. Therefore, in the process of value evaluation, only by actively paying attention to the two value drivers of the target company can we grasp the essence of the company's operating conditions and make an accurate judgment of the company's value.

Historical business performance analysis focuses on analyzing the key value drivers of a company, which can provide an essential perspective for judging and evaluating the company's future performance. The rate of return on invested capital and the proportion of the company's profits that it invests for growth drives free cash flow, which in turn drives the growth of the company's value.

1. Definition of core value drivers

According to the classification of the company's core value drivers , there are three main variables, which are defined as follows:

Return on invested capital is equal to net operating profit before adjusted taxes divided by invested capital

Net operating profit excluding adjusted taxes represents the company's operating profit after adjusting taxes on the cash basis of receipts and payments; Investment capital is the amount of capital invested in the business of a company. It includes the company's property,Net plant, equipment and other assets (sum of new current assets and fixed assets).

2. Calculation of value drivers

Let's focus on the value driver itself, the return on invested capital.

（1） According to the above formula, the return on invested capital is the ratio of net operating profit minus adjustment tax to invested capital. The capital invested here is the increase in working capital and the increase in fixed assets as described in the previous chapter combined with the and. In calculation, net operating profit deducting adjustment tax and investment capital should be defined exactly the same; That is, if an asset is included in the investment capital, the profit related to that asset should also be included in the net operating profit net of the adjusted tax.

Return on invested capital compared with other financial ratios such as return on assets (or earnings per share) is a better analysis method, which focuses on

analyzing the actual operating performance of the company. An effective analytical tool for Return on invested capital is to plot a return on invested capital tree.

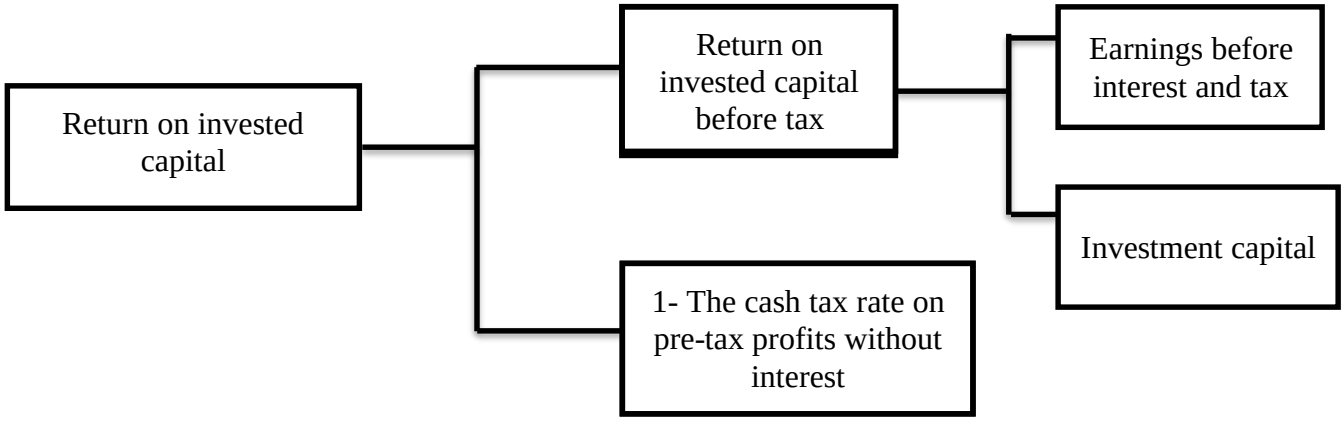

Figure4.1 Tree diagram of return on invested capital

Note-source：It's from the China National Knowledge Infrastructure

Of course, the composition of return on invested capital should be determined by industry and company. Moreover, return on invested capital can reflect a company's business strategy relative to its competitors, such that higher earnings can compensate for lower capital turnover.

（2） Comprehensive historical perspective

Once the calculation of the driving factors of the company's historical value is completed, the development trend can be found and compared with other companies in the same industry, and the results can be analyzed.

This perspective combines financial analysis and industrial structure (differential opportunities, entry and exit barriers, etc.) analysis, and evaluates the company’s competitive advantages and weaknesses.

Since this comprehensive perspective is not a mechanical process, it is difficult to provide a comprehensive and complete list for understanding the company's historical performance. The following points should be noted:

1. Try to understand the company's value driving factors as much as possible, as close as possible to the measurement of business performance Measure;
2. The historical review time should be as long as possible, which will help to understand whether the industry and the company tend to return to a certain operating level over time, and whether the short-term trend is likely to become a long-term breakthrough in history;
3. If the company fundamental changes have taken place in operating performance. The root cause of the changes should be clarified and it should be

determined whether it is real or just an accounting effect, and whether the changes are likely to last [39].

4.2 Company business performance forecast

After analyzing the company's historical operating performance, we began to forecast the company's future operating conditions. The focus of the forecast is to understand the company’s key value drivers, how the company will act and perform in terms of growth rate and return on invested capital. By analyzing the overall situation of the target company’s industry.

4.2.1 Evaluation of the company's strategic position

Evaluate the industry performance prospects, and then analyze the target company’s strategic position in the industry, competitive advantages and weaknesses, and then complete the company’s performance forecast.

1. Analysis of industrial competition structure

The general analysis framework of industrial competition structure was established by Michael Porter of Harvard University in his classic book "Competitive Strategy", and later supplemented in"Competitive Advantage"[39]. as shown in Figure 4.2. From the analysis structure diagram, we find that not only the competition within the industry will determine the profitability of the entire industry, four external forces also play a certain decisive role in the profitability of the industry. The bargaining power of suppliers and buyers, the threat of potential substitutes, and industry entry and exit barriers together constitute the external driving force of industry profits.

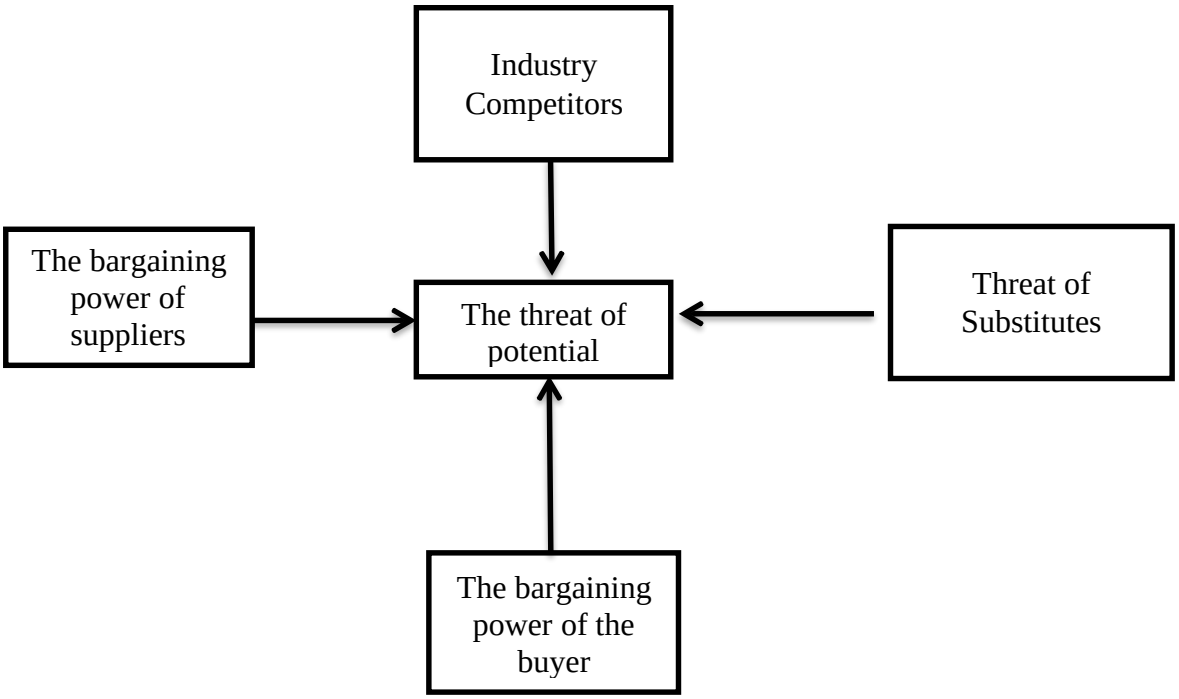

Figure4.2 Five competitive forces that determine the profitability of production
Note-source: It's from the China National Knowledge Infrastructure

The bargaining power of suppliers, in fact, the core impact is mainly the cost of products. How to analyze it? In fact, it mainly depends on the concentration of suppliers and the scarcity of raw materials. If the suppliers are very concentrated and there are only a few in an industry, then the company will not have too strong a voice for the suppliers, and the suppliers have a strong ability to raise prices.

The bargaining power of the buyer will influence the price of the product. If the industry has the following characteristics:

There are only one or two buyers for a product or service and a seller's market consists of a large number of relatively small companies. And this product itself is relatively standardized, highly substitutable. Then buyers in this industry will have a lot of power to control prices.

Threat of potential entrants. This point mainly discusses the entry barriers of the industry, because it directly determines whether there are more or less competitors in the industry, and then affects the price and profit space of the enterprise. Generally speaking, barriers to entry in an industry mainly include: technical requirements, economies of scale, capital requirements, switching costs of users, development of sales channels, government policies, supply of raw materials, geographical location, etc. The core is to see whether the potential surprise competitors can more easily grasp the core competitiveness of the industry, into this new industry.

The situation of competitors in the industry, which also considers the impact of the intensity of competition on the profit, will mainly affect the price of products.

The threat of substitutes is reflected in the fact that the improvement of the price and profitability of the existing products of the enterprise will be limited. If the substitutes are more acceptable to the customers, the impact of such restrictions will be more obvious. To cope with the threat of substitutes, the company mainly adopts the following methods :(1) improve the quality of products; (2) Reduce prices by reducing product costs; (3) To transform the existing products and add new selling points; (4) Increase marketing budget and promote sales.

2. Customer category analysis

The purpose of customer category analysis is to assist in estimating the company's potential market share by determining why customers choose the company's products rather than competitors. This analysis method can also enable us to understand the difficulty for competitors to stand out, provide personalized services according to different types of customers, determine the degree of profitability, and enhance the value of the company. Customer category analysis generally divides customers from two perspectives: producers and customers.

4.2.2 Performance Forecast

The structure of the forecast, which is the order in which the various variables are forecast and the way in which they relate to each other, must be determined before the specific performance forecast. The best forecasting structure begins with the forecast of the balance sheet and the consolidated income statement from which the statement of free cash flow and other value drivers can be derived. Although the free cash flow statement can also be predicted directly, rather than through the balance sheet and income statement, it is easy to ignore the relationship between the components. The breakdown of the forecast should be based on a careful analysis of the industrial structure and the internal capabilities of the company. An analysis of the historical level of valuation variables is a useful starting point. Once these data have been calculated, it is helpful to consider the following points to gain insight into the future level of each valuation variable.

As a general rule, most forecasts should be divided into two or more periods: a definite forecast period and subsequent years. Detailed prediction is made for the previous period, and continuous value assessment method is generally used to estimate the prediction work for the later period. A definite forecast period should be a long enough period for the firm to reach a relatively stable state at the end of the forecast period, that is, the firm can earn a fixed rate of return on investment on all new capital invested during the continuous value period. The firm's base level of invested capital earns a fixed rate of return on investment; The company reinvests a fixed percentage of its profits every year. Usually in excess of the company's cost of capital

The forecast period is determined by the forecast time of the continuous rate of return on the new investment. Microeconomic analysis shows that competition can drive the return on invested capital to cost of capital levels in many industries over time. Once a firm's return on investment converges to its cost of capital, it is relatively easy to estimate its continuous value. So,The test period should be long enough for the return on investment to consistently exceed the weighted average cost of capital. In addition, considering the impact of the business cycle, the forecast period should include at least one complete business cycle(the business cycle is generally judged according to the type of enterprise, generally less than 10 years); for cyclical industries, the forecast period should include at least one complete cycle [28].

The most common method of forecasting the income statements and balance sheets of non-financial companies is demand-driven forecasting. Demand-driven forecasts start with sales, and most of the other variables such as expenses and liquidity come from sales forecasts. Use the Return on Invested Capital Tree to organize the forecast and serve as a consistent check.

4.3 Weighted average capital cost estimation formula

Weighted Cost of Capital (WACC) is a weighted average of the different financing costs of a company. The general formula is as follows:

$$WACC=Kp(1-Tg)B/V+Kp\ (P/V)+Ks(S/V)$$

B= the market value of debt
P= the market value of preferred stock
S= the market value of equity capital
Kb= cost of debt before tax
Kp= after-tax capital of preferred stock
Ks= cost of equity capital
Tg= Marginal Tax Rate
V= Market Value of the Company

Weighted cost estimation is divided into three steps, respectively:

(1) to determine the target market value weight of the cost structure;
(2) Estimate the opportunity cost of non-equity financing;
(3) Estimate the opportunity cost of cost of equity financing.

4.3.1 Determine the weight of target market value

The first step in estimating the WACC is to determine the capital structure of the company that needs to be valued. To accomplish this step, you must consider the target capital. The reason is:

(1) The Company's capital structure may at any time not reflect the expected capital structure throughout the business, and management may plan to change the Company's current capital structure. As a result, the company's future funding level may be different from its current or past levels.

(2) The target capital structure can solve the cycle problems involved in the estimation of the weighted average cost of capital.

Because we need to know the market value weights to determine the weighted cost of capital. But we cannot know the market value weights without first understanding the market value, especially the equity capital value. Determining the value of equity is the objective of the valuation process itself. One way to solve the cycle is to use a weighted average cost of capital.

A simple iteration is performed between the results of weights and equity capital value [30]. The second approach is to conceive of an ideal target capital structure that is not subject to changes in the value of the firm and does not draw potentially wrong conclusions about the impact of the capital structure on value.

There are three ways to create a targeted capital structure for your company:

(1) Try to estimate the company's capital structure based on the real market value. The best way to estimate the capital structure based on market value is to value the capital structure elements directly according to their market prices.

(2)Review the capital structure of comparable companies.

Comparing the capital structure of the company being evaluated to that of similar companies,

It is helpful to understand whether there are anomalies in the current estimates of the capital structure of the target company. At the same time for non-public companies, the use of comparable companies can help to evaluate whether the target share capital ratio determined by the iterative method is reasonable.

(3) Contact directly or indirectly with the management of the Target Company, review the explicit or ambiguous business financing policy of the management and determine its impact on the capital structure of the Target.

4.3.2 Estimate non-equity financing costs

1. Calculation of the cost of debt

Cost of debt is the cost of debt borrowed by a company to finance an investment project. Generally speaking, the factors that affect the cost of debt are as follows:

(1) Spot interest rate level: when the market interest rate rises, the debt cost of the company also rises; As market interest rates fall, so does the cost of debt for companies.

(2) Corporate default risk: the higher the corporate default risk, the higher the debt cost. One way to measure the risk of corporate debt default is the credit rating of corporate bonds. The higher the credit rating is, the lower the cost of debt financing will be. The lower the credit rating, the higher the cost of financing a company's debt.

(3) Tax Advantage of Debt: Since interest is paid before tax, the after-tax cost of debt is related to the company's tax rate. The tax advantage of paying interest before tax keeps after-tax costs lower than before tax. The higher the corporate tax rate, the greater the advantage.

After-tax debt cost = pre-tax debt cost × (1 - tax rate)

2. Calculation of Direct Preferred Capital If the cost of preferred shares is sustainable, non-redeemable and non-convertible, it can be calculated by the following formula:

Kp=div/p

Kp= preferred stock cost; Div = preferred stock dividend; P = Preferred stock market price

If the current market price is not available, it can be estimated using returns on stocks of similar quality. For term or callable preferred shares, the same method can be used to estimate costs for comparable bonds. For the issue of convertible preferred stock, the option pricing method should be adopted.

4.3.3 Estimate the cost of equity financing

Capital asset pricing model or arbitrage pricing model is generally used to estimate the cost of equity. Although there are problems in the application of both models, the methods themselves are theoretically correct. In practice, capital asset pricing model is used as the main application method.

4.4 Continuous value estimation

After dividing the future cash flow of the company into two parts, the value of the company is defined as follows: value is equal to the present value of the cash flow during the definite forecast period plus the present value of the cash flow after the definite forecast period. The second half of the equation is the continuous value. Estimate the continuous value of high quality to the correct progression

Line valuation is extremely important because continuous values often account for a large proportion of the total value of a company. Continuous value estimation consists of four steps:

4.4.1 Select appropriate estimation methods

There are three methods to estimate continuous value by cash flow, which are long-term explicit forecast method, constant growth formula method of free cash flow and value driving factor formula method. As the author has detailed in the previous chapter, it will not be explained here.

4.4.2 Estimate valuation parameters

To estimate continuous value, parameters must be specified. These parameters include net profit after tax (NOPLAT), free cash flow (FCF), return on new capital (ROIC), NOPLAT growth rate (G), and weighted average cost of capital (WACC). Careful estimation is important because the continuous value is very sensitive to the value of these parameters, especially the growth rate assumption.

Fundamentally, estimating the parameters of continuous value is an indispensable part of the whole forecasting process. The continuous value parameter reflects a consistent forecast of the long-term economic conditions of the company and its industry. Specifically, the continuous value parameter should be based on the predicted stability, that is, the firm will evolve according to the specific scenario valued by the forecaster [30].

4.4.3 Continuous value discounting

The estimated continuous value is the present value at the end of the clear forecast period. This estimate must be reconverted to present value at a weighted average cost of capital, which can then be combined with the present value of free cash flow over the clear forecast period to obtain the total value of the target company.

4.5 Calculation and Test of Valuation Results

After the free cash flow, cost of capital and continuous value have been estimated, the total value of the Company can be calculated and tested. The steps are as follows:

4.5.1 Calculation of the Company's share capital value

(1) The weighted cost of capital is used to discount the free cash flow in the clear forecast period and the continuous value outside the forecast period, so as to determine the operating value of the company.

(2) The equity value of the company is obtained by separating the debt, preferred stock and other equity value from the entity value of the company.

4.5.2 Test of the Company's share capital value

(1) Check whether the valuation results are consistent with the predicted value drivers. For example, if the company's projected return on invested capital is significantly higher than its cost of capital, the valuation result should be significantly higher than the company's book value.

(2) Whether the test valuation result is consistent with the current market value of the company. If the difference is significant, it is necessary to identify the reasons for the difference and determine whether the expectations for the company's future operations and financial condition are reasonable. If the expectation is reasonable, then adhere to the original conclusion, if the expectation is not reasonable, it must be necessary to revise the expectation,

CHAPTER 5
ANALYSIS OF THE INFLUENCE OF FREE CASH FLOW ON ENTERPRISE VALUATION

5.1 Advantages and Limitations of Free Cash Flow in Enterprise Valuation

5.1.1 Advantages of free cash flow in enterprise valuation

1. Not subject to human manipulation

Free cash flow can objectively reflect the true value of an enterprise and is not affected by human factors. This is mainly related to the cash method used when recording free cash flow. Free cash flow does not record those non-recurring gains, but only calculates the operating profit of a business. Therefore, free cash flow is also referred to as cash from operating activities. To a certain extent, free cash flow can also make up for the deficiencies of some indicators such as operating profit in reflecting the actual operating conditions of enterprises.

2. It can reflect the time value of corporate currency

The free cash flow of an enterprise will not appear out of thin air. It is the accumulation of funds during the long-term operation and development of an enterprise, and it can truly reflect the time value of the currency of an enterprise. In this way, the evaluation result will be closer to the real value data of an enterprise. Because the free cash flow is calculated based on the actual income and expenditure of cash, if the enterprise does not receive cash, it will not be recorded, and it will be recorded only when it receives cash. In this way, the actual operating situation of the enterprise recorded by the actual cash method can not only reflect the development prospect of the enterprise, but also take into account the influence of inflation and other reasons. Compared with the risk of accounts receivable due to credit sales, free cash flow is visible and tangible, and can better reflect the real cash flow situation of the enterprise.

3. It makes up for the defects of accounting profit accounting and reduces valuation risk

We know that the operating performance of enterprise accounting, mainly through the balance sheet, income statement and cash flow statement to reflect that these from a certain extent, can reflect the enterprise assets, liabilities, profits and cash flow conditions, etc., but if we look at a certain accounting statements, You can't really see how the business is doing. And the free cash flow is different, its data is

derived from the three main financial statements of the enterprise, and combined the three statements on the analysis of cash flow, to more fully reflect the enterprise's overall management level, to avoid due to human factors affect the authenticity of accounting, and also can reduce the risk of the enterprise value evaluation.

4. It is of practical significance to provide the development direction for a certain stage in the future

The sufficient free cash flow of an enterprise indicates that the amount of funds available for reproduction or reinvestment is relatively large. On the contrary, the lack of free cash flow of an enterprise indicates that the cash flow of an enterprise is not very good. When the capital chain of the enterprise is broken, the enterprise will easily go to the edge of bankruptcy. Because many activities in the enterprise, such as repayment of loans, development of new products, investment and so on, this series of activities, all need to have sufficient funds to give support.

5.1.2 Limitations of free cash flow in enterprise valuation

In the evaluation of the value of an enterprise, there are many angles and contents involved. Only a comprehensive analysis can guarantee the accuracy and effectiveness of the enterprise value evaluation. Although free cash flow has certain advantages in the evaluation of enterprise value, any single evaluation method can not truly reflect the true value of the enterprise. Therefore, free cash flow has certain limitations in the evaluation of enterprise value.

1. Evaluation of the value of free cash flow to some enterprises

Estimate is not applicable to the use of free cash flow to evaluate the value of the enterprise is not applicable to all enterprises. Especially for those enterprises whose financial management is not very good, as well as those enterprises which have just been established and are still in the initial development period or have many assets that have not been used, it is obviously of little significance to use free cash flow to evaluate the enterprise value for these enterprises. Because for these enterprises, their funds are mostly used in the operation and development of the enterprise, there is no surplus funds for the free disposal of the enterprise. Take Biotai as an example. From its cash flow statement, there is not much free cash flow, but Biotai still has a market value of about 20 billion yuan in the capital market.

2. Free cash flow cannot accurately reflect the dynamic value changes of the enterprise

As we all know, an enterprise is constantly developing, that is to say, the situation of the enterprise is constantly changing, and the changes of many factors may affect the change of the value of the enterprise. This change, can not be reflected through free cash flow. For listed enterprises, it is more reflected in the change of

stock price in the stock market. For example, some biomedicine companies that have recently applied for listing on the science and technology innovation board basically have no free cash flow, but they are still able to get listed in the stock market. Even though these companies are losing money, they can still issue shares at a high price to raise funds through the stock market to achieve their goals of development. At this time, although the enterprise has no free cash flow, the value of the enterprise is relatively high in the eyes of the outside world because of the listing.

5.2 Free cash flow should be paid attention to in enterprise value evaluation

The application of free cash flow in evaluating enterprise value should pay attention to the following four problems:

1. Different types of enterprises must be treated differently

The free cash flow of an enterprise varies greatly from industry to industry. Therefore, for different industries, the use of free cash flow, can not adopt a unified method, must be treated differently. For example, for some retail enterprises, the market competition pressure is very large, generally these enterprises will spend more money in the enterprise promotion activities, in order to improve the sales of the enterprise to gain more market share, therefore, for these enterprises, the free cash flow is relatively small. And those enterprises with strong market competitiveness, such as some monopolistic industries, they do not need to think too much about these problems, and the enterprise will have much more free cash flow.

2. Pay attention to the different stages of the organization

The same enterprise, in different development period, its free cash flow situation is also different. Relatively speaking, an enterprise needs capital in all aspects at the beginning of its establishment, so the free cash flow is relatively small, or even negative in many cases. After a period of development, the enterprise may slowly accumulate some idle funds, some capital expenditures used for business operation may decrease, and profits will also slowly increase. Therefore, the enterprise's free cash flow will show a good increase trend. If the enterprise is in the bottleneck stage or in the process of gradual decline, the business situation and profit are not very good, then the free cash flow of the enterprise will also be affected greatly.

3. Clarify the applicable scope of free cash flow

Currently, in foreign countries, free cash flow is widely used in financial consulting, credit rating, investment institutions such as Banks, because of the free cash flow on the measure the operating performance and investment value of enterprise performance is significantly higher than the net profit, operating activities cash flows and other indicators, so, in our country, On the premise of having a deeper understanding and understanding of free cash flow, we should overcome some of its shortcomings, gradually expand the application scope of free cash flow, and vigorously promote it in the fields of enterprise performance evaluation and intangible assets single value evaluation.

4. Pay attention to the limitations of free cash flow itself

As one of the methods to evaluate the value of an enterprise, free cash flow is good, but due to the different types of enterprises, the different stages of development of enterprises and the complex market competition environment, when using free cash flow, we must pay attention to some of its own shortcomings. For example, when it comes to inflation, be sure to consider it in terms of the impact of inflation, especially in long-term investment, it is necessary to make a prediction of the inflation situation before the evaluation of enterprise value, and make timely adjustments as the inflation situation changes, rather than adopt a unified standard to evaluate the enterprise value.

In the more and more complex market competition environment, to make the correct value evaluation of the enterprise, can better deal with the fierce and cruel market competition, so, how to carry out the enterprise value evaluation, and what method to use to evaluate the value of the enterprise, is a problem that enterprises and the public are very concerned about. Free cash flow as an important one of the ways to evaluate the enterprise value, because it is not easily influenced by artificial factors, and can better reflect the time value of the enterprise, and is used by many companies, but any kind of evaluation method is not everything, so in the use of free cash flow to the enterprise value assessment, It is necessary to comprehensively consider the actual development situation of the enterprise and the industry characteristics of the enterprise to choose a scientific method for enterprise value assessment, so as to make the results more real and valuable, so as to provide more valuable reference for the future development decision of the enterprise and help the enterprise to achieve sustained stability and even greater development.

CHAPTER 6
ENTERPRISE VALUATION CASE DESCRIPTION

Due to the enterprise value assessment itself, has a strong subjectivity and uncertainty evaluation results not only depends on the selection of model, evaluation personnel's experience, the degree of in-depth investigation and evaluation of the enterprise information number are greatly affects the accuracy of the evaluation results, in addition, both in the service of management decisions and property changes, It is a very difficult problem to obtain data in enterprise value assessment. Therefore, although there are many case studies on enterprise value assessment methods in domestic and foreign academic circles, the empirical studies on large samples are rarely paid attention to.

6.1 Study of Tom Copeland

Tom Copeland et al. used the value line investment survey [28] to make the prediction, used the cash flow discount method for 35 enterprises, and found that the appraised value was highly positively correlated with the market value. Since the market price was affected by many factors in the capital market, these results may not be very scientific. But it also proves that the discounted cash flow method can be used to explain the market value of enterprises.

6.2 Bridford Conrad Study

Bridford Conald in Enterprise Valuation: Tools for Effective Valuation and Decision-Making(2001) [41] system is introduced in the discounted cash flow technique theory, using ford enterprise instance specific practical application of this method are introduced, Mr. Bridle ford connor, pointed out that because of the estimates of the cost of capital is usually use standard financial calculation, therefore, cash flow line method essentially depends on the cash flow forecast effect, This method has the advantage of adapting to various situations. It does not require that the target enterprise to be evaluated is a public listed enterprise, nor does it require that there is a comparable enterprise that is easy to find. What it requires is only a reasonable estimate of future cash flow and discount rate, which is the advantage of cash flow discount method, but also its disadvantage.

CONCLUSIONS

In the process of working on the Master's thesis, we talked about free cash flow earlier. Cash flow is the inflow and outflow of cash and cash equivalents. In general, the fluctuation of free cash flow is consistent with the change of enterprise operating risk. The quality of earnings can be determined by examining the free cash flow of an enterprise. However, investors tend to pursue the maximization of enterprise value, and enterprise value is positively correlated with cash flow. That is to say, under the same conditions, the greater the free cash flow of an enterprise, the greater its value. The ultimate goal of an enterprise is to pursue the maximization of enterprise value. Value maximization is to maximize the total value of an enterprise by reasonable operation, optimal financial decisions, and considering the time value, value at risk and sustainable development ability of funds.

When estimating the enterprise value with free cash flow method, the enterprise value is divided into the enterprise value with clear forecast period and the enterprise value after clear forecast. The enterprise value of both segments is determined by free cash flow and the discount rate.

Free cash flow discount method requires the estimation of the company's future cash flow and the selection of a reasonable discount rate. It is difficult and complex, so it is suitable for professional organizations to use on the basis of detailed investigation. In valuation, only when the company's current cash flow is positive, the size and growth of future cash flow can be estimated more reliably, and the appropriate discount rate can be determined according to the risk characteristics of cash flow, the discount cash flow model can be directly used.

Free cash flow analysis has intuitive implications and can be easily applied to corporate value analysis, industry analysis and portfolio analysis. With the strengthening of investors' attention to cash flow analysis, enterprise value analysis and securities pricing in the market should be based on cash flow rather than profit in the merger and reorganization of enterprises, which is of great significance to change investors' new investment philosophy.

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APPENDIX A

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